DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON 25, D. C.

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24 SEP 1952

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~~SECURITY INFORMATION~~

From: Chief of Naval Operations
To: Commander in Chief, U. S. Atlantic Fleet

Subj: Tracking of U. S. submarines by HFDF during CONVEX III, 27 February - 19 March 1952

Encl: (1) 20 copies of subject report

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J. A. MORRISON
Captain, U. S. Navy
Head, Security Branch
Naval Communications Division
By direction

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REPORT OF

TRACKING OF U. S. SUBMARINES BY HFDF

DURING

CONVEX III, 27 FEBRUARY - 19 MARCH 1952

OPNAV (DNC - OP-202)

SEPTEMBER 1952

~~SECRET~~

REPORT OF

TRACKING OF U. S. SUBMARINES BY HFDF

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OPNAV (DNC - OP-202)

SEPTEMBER 1952

I. PRELIMINARIES AND PARTICIPATION

101. The Commander in Chief, U. S. Atlantic Fleet (CINCLANTFLT) requested that the Chief of Naval Operations (Director, Naval Communications) furnish to CINCLANTFLT, the Headquarters, Commander Eastern Sea Frontier (COMEASTSEAFRON) and the Headquarters, Commander Caribbean Sea Frontier (COMCARIBSEAFRON), for analysis and further dissemination to appropriate commands afloat, results obtained by the Atlantic high frequency direction finding (HFDF) net on radio communications of "enemy" submarines and surface raiders during CONVEX III (27 February - 19 March 1952).

102. The radio frequencies and indefinite call signs to be used by the "enemy" forces during CONVEX III were provided to the Office of the Chief of Naval Operations (OPNAV) by Commander, SECOND Fleet.

103. The Director, Naval Communications (DNC - OP-202) designated Communication Supplementary Activities, Cheltenham, Md., and San Juan, P. R. as net control and alternate net control respectively. Cheltenham and San Juan were assigned, in addition to their regular DF duties, search on the frequencies assigned to "enemy" forces. A dual "flashing" system was employed for the exercise; both net control and alternate could transmit "flash" directives on the flash circuit to alert the net to "enemy" transmissions. The Atlantic HFDF plotting center, U. S. Naval Security Station, Washington, D. C. was assigned, in addition to its regular duties, to plot and fix "enemy" targets and to disseminate results to CINCLANTFLT, COMEASTSEAFRON and COMCARIBSEAFRON. A landline circuit was employed between the Director of Supplementary Radio Activities (DIRSUPRADACT), Royal Canadian Navy, Ottawa, and the plotting center for relaying bearing reports from Canadian stations, two landline circuits were employed between net control (Cheltenham) and the plotting center and a radio teletypewriter circuit was employed between alternate net control (San Juan) and the plotting center to relay bearing reports and intercepted traffic.

104. The Atlantic HFDF net during CONVEX III consisted of the following:

a. Nine U. S. Naval HFDF stations as follows:

Name	Station No.	Location	Function
Cheltenham, Md.	USN 22	38-45-10N 76-51-20W	DF, net control, and intercept
San Juan, P. R.	USN 19	18-27-48N 66-12-12W	DF, alternate net control & intercept
Port Lyautey, F. M.	USN 12	34-14-56N 06-35-13W	DF
Imperial Beach, Calif.	USN 15	32-32-20N 117-07-54W	DF
COMMUNIT 33	USN 17	- - - - - - - - - - -	DF
Dupont, S. C.	USN 18	32-48-00N 80-04-00W	DF
Winter Harbor, Me.	USN 20	44-24-18N 67-59-06W	DF
Toro Point, C. Z.	USN 23	09-22-31N 79-56-58W	DF
Amagansett, L. I., N.Y.	USN 415	40-58-10N 72-07-27W	DF

b. Four Royal Canadian Navy HFDF stations as follows:

Name	Station No.	Location	Function
Gander	CAN 90	48-58-22N 54-36-03W	DF
Coverdale	CAN 96	46-04-00N 64-45-30W	DF
Gloucester	CAN 97	45-18-32N 75-30-50W	DF
Chimo	CAN 94	58-06-00N 68-25-00W	DF (part-time operation)

Personnel assigned to DF and associated work at U. S. net stations during CONVEX III totaled 13 officers and 142 men, and in the plotting center, 5 officers and 40 men. Personnel were not augmented for this exercise.

105. Two mobile DF units consisting each of 1 officer and 6 communication technicians, all of whom were qualified COMMSUPACT DF operators, were assigned to the USS SALERNO BAY (CVE 110) and the USS MINDORO (CVE 120). Publications and crypto aids were provided to enable these units to operate as stations of the Atlantic HFDF net. Although the primary mission of the units was to provide bearings obtained to the Hunter/Killer commands afloat, they reported bearings by radio to alternate net control.

106. Beginning at 0001Z 27 February and continuing through 2400Z 19 March COMMSUPACTS, Cheltenham and San Juan, intercepted all possible submarine transmissions on probable "enemy" frequencies and "flashed" the net by radio for each suspected "enemy" transmission heard.

107. COMSUBLANT previously recommended and CNO approved submission to DNC (OP-202) submarine transmission data forms vice complete radio logs to reduce paper work and present pertinent information in tabulated form.

108. Flashing station search operators heard and flashed suspected "enemy" transmissions on the 4155 kcs. series. Submarines acknowledged in their transmission data forms a total of 46 transmissions on the 4155 kcs. series; 33 (71%) of these were flashed. Although not acknowledged in transmission data forms, 97 other transmissions using the calls NA through NJ on the 4155 kcs. series were flashed. This indicates:

a. Many other units using call signs from the "enemy" blocks transmittin on the 4155 kcs. series, or

b. Many "enemy" transmissions not reported in transmission data forms.

II. RESULTS

201. Direction Finding.

a. Overall DF results are summarized in the following tables:

(1) DF flashes:

Flashes made on enemy units	54
Flashes made on non-enemy units*	1247
Cancelled and dummy flashes	745
Total	2046

*Includes strategic, miscellaneous, and suspected enemy transmissions later disregarded.

(2) DF messages:

Fixes reported, acknowledged by transmission data forms received from submarines	31
Matched transmissions, no fix made	23
Other fixes reported	236
Total fixes reported	267
Amplifying messages sent	109
Other messages pertaining to non-enemy transmissions	1205
Total DF messages sent	1604

(3) Time:

Average time required, in minutes, from time of transmission of DF flash to TOR at CINCLANT and COMEASTSEAFRON:

Bearings reported by USN 22....22.3 minutes
Bearings reported by USN 19....24.6 minutes

(4) Comparison of fix evaluation:

	A	B	C	D	U
Reported fix classification	0	1	17	12	1
Difference between DF fix and rep. pos	5	9	13	3	1

(5) Number of bearings per fix:

	#	%
Fixes with 4 bearings	2	7
Fixes with 5 bearings	1	3
Fixes with 6 bearings	4	13
Fixes with 7 bearings	6	19
Fixes with 8 bearings	4	13
Fixes with 9 bearings	4	13
Fixes with 10 bearings	3	10
Fixes with 11 bearings	2	6
Fixes with 12 bearings	2	6
Fixes with 13 bearings	3	10
Total	31	100

Average number of bearings per fix..... 8.05

b. DF bearing accuracy:

Number and classification of bearings reported

Station No.	A	B	C	D	Q	Total
12	0	3	3	0	1	7
15	0	9	5	0	0	14
17	1	10	4	2	0	17
18	4	29	11	1	0	45
19	3	29	6	2	1	41
20	2	23	12	2	0	39
22	4	30	5	2	0	41
23	7	12	13	2	0	34
415	0	15	22	7	0	44
90	3	6	9	0	0	18
96	9	8	0	0	0	17
97	10	16	2	0	0	28
Totals	45	190	92	18	2	345

A-B-C BEARING ACCURACY

Station No.	Total ABC bearings	Non-wild*		- wild		+ wild		Systematic error	Standard deviation
		#	%	#	%	#	%		
12	6	5	83	1	17	0	0	+2.60	7.39
15	14	7	50	4	29	3	21	+1.43	5.39

Station No.	Total ABC bearings	Non-wild*		- wild		+ wild		Systematic error	Standard deviation
		#	%	#	%	#	%		
17	15	12	80	0	0	3	20	+7.33	3.38
18	44	39	89	0	0	5	11	+2.28	4.31
19	38	38	100	0	0	0	0	+0.16	5.21
20	37	36	97	0	0	1	3	+1.97	4.00
22	39	36	96	0	0	3	4	-0.56	6.15
23	32	29	91	1	3	2	6	-0.69	4.82
415	37	34	92	1	3	2	5	-0.35	3.98
90	18	13	72	2	11	3	17	-1.97	8.00
96	17	16	94	1	6	0	0	-5.63	4.41
97	28	28	100	0	0	0	0	+0.54	3.76
Totals	325	293	90	10	3	22	7		

*Bearings with error greater than 15 degrees are considered wild.

c. Time study:

(1) Breakdown of average time, in minutes, required to measure and forward bearings, determine fixes, and forward fixes to CINCLANT and COMEASTSEAFRON:

Number of DF messages sent	#Average DF time	*Average Plot. time	@Average coding and Communication time	Total
1604	11.2(USN 22)	2.2	8.9	22.3
	13.5(USN 19)	2.2	8.9	24.6

#Computed from time enemy transmission was noted and DF flash was transmitted to TOR of bearings in the plotting center.

*Computed from time of receipt of bearings in the plotting center to delivery of DF message to the coding room.

@Computed from time of delivery of DF message to code room to TOR at CINCLANT and COMEASTSEAFRON.

d. DF fix results:

(1) Average difference in position existing between DF fix and position listed on submarine transmission forms: .....64 miles.

(2) Number and percentage be specific distances:

	#	%
Fixes with difference of 10 nautical miles or less	1	3
Fixes with difference of 11 through 25 nautical miles	4	13
Fixes with difference of 26 through 50 nautical miles	9	29
Fixes with difference of 51 through 100 nautical miles	13	42
Fixes with difference of 101 through 200 nautical miles	3	10
Fixes with difference over 200 nautical miles	1	3
Total matched fixes	31	100

e. Summary of DF fix evaluation:

Total matched fixes	Closer than fix evaluation	Within fix evaluation	Greater difference than fix evaluation
31	20-64%	8-26%	3-10%

202. Shipboard HFDF

The shipboard HFDF teams, in addition to reporting bearings to alternate net control, furnished the following numbers of bearings on "enemy" targets to task group commanders:

USS MINDORO. 85
USS SALERNO BAY. 9*

*The DAU DF equipment on the SALERNO BAY was inoperative except for two days.

203. The following is a comparison of various items from reports of previous Atlantic HFDF net participation in LANTFLT exercises with corresponding items from this report:

ITEM	PORTREX	CARIBEX	CONVEX I	CONVEX II	LANTFLEX 52	MICONEX 52	CONVEX III
Number of DF stations in Atlantic HFDF net	6	6	10	10	12	13*	14#
Total number DF flashes sent by net control	695	160	606	697	2913	2148	2046
Total number DF fixes made	289	74	43	50	210	130	334
Total no. DF fixes prom. to CINCLANTFLT or ASW forces	113	28	40	45	169	130	267
Total no. DF fixes prom. and later matched to sub positions	110	27	27	36	148	27	31
Total no. hours of DF participation	208	46	282	395	624	336	460
Average hourly number of DF flashes sent by net control	3.3	3.5	2.1	1.8	4.7	6.4	4.4
Average hourly number of DF fixes promulgated	0.5	0.6	0.14	0.11	0.27	0.39	0.58
Average time in minutes required to promul. DF fixes (from time of flash by net control to completion of transmission of fix message to ASW forces or CINCLANTFLT)	31.5	29.2	27.9	34.4	66.0	55.2	22.3
Number of "enemy" subs participating	11	11	10	6	21	6	9
Average "error" of DF fixes (in nautical mi.)	68.2	55.6	65.4	81.9	99.4	155.6	64
Average "error" of DF fixes (in nautical mi.) on spurious aircraft transmissions	-	-	-	-	-	-	61.7
Average number of DF bearings per fix prom.	5.1	5.0	5.9	4.7	7.8	7.9	8.5
Number and per cent of fixes closer than evaluated	46 41.8%	16 59.3%	14 52%	22 61%	53 36%	4 15%	20 64%
Number and per cent of fixes same as evaluated	37 33.6%	6 22.2%	8 30%	5 14%	50 34%	9 33%	8 26%
Number and per cent of fixes farther off than evaluated	27 24.6%	5 18.5%	5 18%	9 25%	45 30%	14 52%	3 10%

*Including one shipboard unit.
#Including two shipboard units.

III. DISCUSSION

301. Participation in CONVEX III demonstrated the effectiveness and accuracy of the Atlantic HFDF net in obtaining fixes on targets operating in the Caribbean and contiguous areas. The average accuracy of the fixes matched to recorded positions of submarines and aircraft was better than in any previous Atlantic fleet exercise, except during the two days of CARIBEX in 1950. Improvements in procedure for collecting bearings from the net stations, evaluation of plots and drafting and transmitting fix messages resulted in significant reduction of the time lag between time of transmission of the target and time of delivery of fix messages to CINCLANTFLT and COMEASTSEAFRON.

302. Although inclusion of Imperial Beach (USN 15) in the Atlantic HFDF net hindered to some extent the savings in time from improved procedures of collection, it demonstrated the flexibility of DF operations. USN 15's efficiency (ratio of bearings obtained to number of flashes) was slightly better as a member of the Atlantic net than the long-term average as a member of the Pacific net. An accurate appraisal of value of the bearings obtained by USN 15 in improving evaluation of fixes cannot be made; however the plots and relative accuracy of the bearings obtained reveal a definite contribution by this station to the overall accuracy of the net.

303. Participation of the two DF teams afloat resubstantiated the conclusion from previous exercises that "on the scene" bearings obtained by teams afloat are extremely valuable to the "friendly" forces afloat but do not contribute significantly to the fixes obtained by the Atlantic net. It was hoped that a study could be made of the effectiveness of two cooperating DF teams afloat during CONVEX III; however, the difficulties with the DF equipment on board the USS SALERNO BAY prevented combined operations between the two teams.

304. The transmission data forms submitted by submarines and aircraft to OPNAV (DNC) were generally good. The following discrepancies were noted in a few instances:

a. Incorrect recording of call signs.

b. Inaccurate recording of times of transmission.

c. Inaccurate recording of positions.

MIDDLE

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THE ATLANTIC COMMAND
AND UNITED STATES ATLANTIC FLEET
HEADQUARTERS OF THE COMMANDER IN CHIEF
Norfolk 11, Virginia

REFER TO
FF1-2/A4-3
(0759)

15 April 1952

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SECURITY INFORMATION

From: Commander in Chief U.S. Atlantic Fleet
To: Commander SECOND Fleet

Subj: General Observations on CONVEX THREE

Encl: (1) Subject Observations

1. CINCLANTFLT's general observations on CONVEX THREE are forwarded herewith.

2. These observations are based solely on information which became available to the Headquarters as the operations unfolded, and are not the result of reports from subordinates nor of careful analysis of existing data.

L. D. McCORMICK

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ENCLOSURE (6) TO COMSECONDFLT
Ser 097 of 29 May 1952

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GREENWICH BAY (AVP-41)	2	WALLER (DDE-466)	2
		CONWAY (DDE-507)	2
COMCRUDIV 4	2	CONY (DDE-508)	2
COMCRUDIV 6	2	R. A. OWENS (DDE-827)	2
MACON (CA-132)	2	DAMATO (DDE-871)	2
WORCESTER (CL-144)	2		
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COMTRANSDIV 22	2
MARQUETTE (AKA-95)	2
COMTRANSDIV 23	2
COMTRANSDIV 24	2
OGLETHORPE (AKA-100)	2
CAMBRIA (APA-36)	2
THUBAN (AKA-19)	2
GLYNN (APA-239)	2
BOTTINEAU (APA-235)	2
COMLSDRON 2	2
COMLSDDIV 22	2
FORT MANDAN (LSD-21)	2
RUSHMORE (LSD-14)	2
SAN MARCOS (LSD-25)	2
COMLSDDIV 23	2
CARTER HALL (LSD-3)	2
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CROSS (DE-448)	2
ALLEN (DE-531)	2
W. T. POWELL (DER-213)	2
COMEASTAREACG	2
COMWESTSEAFRON	2
PRESNAVWARCOL	2
COMPANSECTCARIBSEAFRON	2
CINCNELM	5
CINCPACFLT	10
CNO	10
COMFAIRWING 3	2
COMFAIRWING 11	2
COMTRACOMLANT	2
COMOPDEVFOR	2
COMNABS 1ND	2
COMNABS 3ND	2
COMNABS 4ND	2
COMNABS 5ND	2
COMNABS 6ND	2
COMEASTSEAFRON (For distribution to ND craft not listed)	25
VS-22	2
VS-26	2
VS-31	2
VS-32	2
VS-913	2
VC-4	2
VC-5	2
VF-32	2
CURRITUCK (AV-7)	2
VP-3	2
VP-5	2
VP-23	2
VP-34	2
VP-44	2
VP-45	2
VP-49	2
VP-661	2
RCAF 404	2
RCAF 405	2
VX-1	2
VX-4	2

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ZP-1	2
ZP-2	2
ZP-3	2
ZP-4	2
USCG 83327	2
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USCGC TAMOROA	2
USCGC MARION	2
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USCGC ARICONE	2
USCGC AURORA	2
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COMSUBRON 2	2
COMSUBRON 4	2
COMSUBRON 6	2
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QUILLBACK (SS-424)	2
CUTLASS (SS-478)	2
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NCSO PORT ARTHUR	1
NCSO CHARLESTON, S.C.	1
NCSO GUANTANAMO	1
NCSO SAN JUAN	1
NCSO CANAL ZONE	1
NCSO TRINIDAD	1
Temp NCSO (INSP/INSTR NR Jacksonville, Fla.)	1
Temp NCSO (CO NAS Miami)	1
Temp NCSO (CO NAS Pensacola)	1
Temp NCSO (CO NAS Corpus Christi)	1
Temp NCSO (COMNAVBASE Newport)	1
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SECURITY INFORMATION

GENERAL OBSERVATIONS ON CONVEX THREE

1. General

a. CONVEX THREE, as a whole, proved to be an excellent vehicle for the initial test of CINCLANTFLT Operation Order No. 3-51. Planning and carrying out of operations by commanders concerned and their subordinates was done with a spirit of enthusiasm that was particularly pleasing to the Commander in Chief.

b. In general, there was continuingimprovement in the operations of all elements over that seen in previous exercises, showing the application by forces concerned, of lessons learned in earlier ASW and shipping control operations. Whereas the scoreboard at this Headquarters showed many sinkings, particularly among the escorts, the combined efforts of all in the control and protection of shipping were such that the task of "the safe and timely arrival of shipping" was performed with gratifying success.

c. The extent of the improvement indicated above will not be fully known until a comprehensive study is made of all reports.

2. Command Organization - Whereas, as indicated above, CONVEX THREE proved to be an excellent operation for testing CINCLANTFLT Operation Order No. 3-51, the following remarks are considered pertinent:

a. The limited time available, coupled with the long distances enroute and the requirement for forces involved to be at Norfolk at both beginning and end of exercise, created the following artificialities:

(1) Although a great deal of effort was expended in preparing convoy schedules in order to separate shipping, there was an unavoidable bunching thereof. During the first and last weeks, convoys were primarily in the South Sector of the Eastern Sea Frontier and in the second week they were confined primarily to the Antilles Sector of the Caribbean Sea Frontier. As a result, and particularly in the Eastern Sea Frontier, operational decisions by commanders concerned were, in general, limited to problems arising in small segments of their areas. Accordingly, as in CONVEX TWO, the scope of operations approximated that which, in wartime, is envisaged for the Sector rather than the Sea Frontier Commander. As a result, the Commander in Chief considers that the need for the Sector Commander was not fully tested.

(2) There was an apparent movement of enemy submarine activity to follow the shipping. This shift was considered to be of value in that commanders concerned redeployed forces in a highly realistic manner to meet the rapidly changing threat.

b. The command structure existing during CONVEX THREE appeared to work very well and commanders showed no hesitancy in exercising initiative.

c. Certain problems in the command structure appeared in CONVEX THREE due to employment for the first time of two Sea Frontier Commanders as well as the areas involved in the operation and the new uses to which forces were put. While final judgement on resolving of these problems will await the completion of study of comments received from the commanders involved, it is considered at this time certain comments with regard to them should be made, as indicated below:

(1) Control of Shore-based Air - Shortly before the beginning of the exercise, both Sea Frontier Commanders changed their methods of control of shore-based air from that which they had previously delineated in their operation orders supporting CINCLANTFLT Operation Order No. 3-51.

(a) In the Eastern Sea Frontier, control of shore-based air elements was exercised by the Commander of Antisubmarine Air directly under COMEASTSEAFRON with element commanders involved reporting directly to Commander Antisubmarine Air. They also reported to Sector Commanders for additional duty. As a result, in the Eastern Sea Frontier, shore-based air was functional throughout the whole eastern seaboard rather than at the sector level.

(b) In the Caribbean Sea Frontier, operational control of air units was given directly to Sub-Sector Commanders. As a result, in the Caribbean Sea Frontier, shore-based air was functional at the sub-sector rather than the sector level.

(c) In both frontiers, the distances between operational bases are approximately the same. In the Eastern Sea Frontier, however, in view of the bunching of convoys commented upon above, action was confined generally to a small area of operations at one time, whereas, in the Caribbean, action was, in general, spread over the whole Antilles Sector. Again, in the Eastern Sea Frontier, the communication facilities were far superior to those available in the Caribbean.

(d) In both sea frontiers, the control of air was performed in a highly satisfactory manner.

(2) Control of Carrier Task Groups engaged in ASW

(a) Carrier task groups whose purpose is ASW may be used as (1) Covering Groups; and (2) as Mobile H/K Groups.

(b) During wartime CINCLANTFLT considers:

1. A Covering Group (or a protective carrier) will normally only be employed in areas which cannot be effectively covered by shore-based

air, or in those cases where the importance of a convoy requires augmentation of air cover. Wherever employed, this type group will normally be under the operational control of the commander who exercises control of the forces being covered either directly or through the commander of the forces being supported.

2. A H/K Group will normally be employed in areas which cannot be effectively covered by shore-based air. The Fleet Commander will usually retain operational control of this type group and operate it outside of other sub-area commanders' waters.

3. When either a Covering Group or a H/K Group is transitting a sub-area commander's waters and the future deployment of such a group is overshadowed by an immediate need in ASW, the Fleet Commander will normally direct the sub-area commander to assume operational control of the transitting group until completion of the mission assigned.

4. Operational control of a H/K Group engaged in action against a known submarine or submarines will not normally be shifted until such action is complete, when such action compels the H/K group to pass into the waters of another sub-area commander.

(c) During CONVEX exercises H/K groups have been employed in order to give them valuable training. When so employed, CINCLANTFLT has retained operational control for the additional purposes of providing proper training of his Headquarters and in order to retain the perspective of command in their normal wartime employment.

(d) When covering groups or H/K groups are in an enroute status and are within economical range of shore-based air, it is considered that, regardless of the operational control of such groups, shore-based air, when requested, should be made available for their protection. This is based on the premise that such requests will depend upon considerations of weather, fuel or the necessity for rapid transit of the area concerned.

(3) Control of Escorts

(a) After certain initial problems were resolved, the control of escorts was well conducted and much initiative was shown in effecting the many redeployments found necessary as a result of the severe losses caused by the "enemy."

(4) Control of Salvage Forces

(a) Salvage operations contemplated by the Commander in Chief, and noted in his Operation Order No. 3-51, envisioned:

1. The initiating of salvage operations, including air and surface protection, by the operational commander of the units concerned.

2. The responsibility of the operational commander to inform, with high priority, CINCLANTFLT's principal advisor in salvage matters, COMSERVLANT.

3. The early assumption by COMSERVLANT (under the sub-area commander concerned) of operational control of the units involved.

(b) This method of control is based upon the highly technical nature of salvage operations, and the necessity for expert opinion in both the operational and logistic phases thereof.

(c) Although in most cases during CONVEX THREE step 1. above was carried out, the remaining steps in a majority of cases were not.

(d) It is considered that the problem, rules and, perhaps, the nature of the salvage operations should be changed in the next CONVEX exercise.

(5) Definition of Areas

(a) In the definition of areas assigned to sub-area commanders, the Commander in Chief has taken into consideration the following factors:

1. The forces expected to be available to sub-area commanders during wartime and their location.

2. The operating radius of such forces.

3. The shipping lanes and the focal points of sea communications and the desirability of having boundaries avoid such areas.

4. The capabilities of sub-area commanders to perform all their functional responsibilities assigned within the area assigned.

5. The desirability of having a single boundary for all aspects of command.

(b) It is considered that the above factors are also pertinent in the division of sub-areas into sectors.

(6) Control of Communications

(a) During CONVEX THREE, 26,341 messages were processed at the Headquarters of the Commander in Chief. 11,137 of the above were CONVEX messages. The above figures do not include the many wire notes and telephone calls which were handled.

(b) The increased traffic load noted above is a result of operations in but a small area of the overall command; the Commander in Chief con-

siders that the system cannot stand the overall increase in wartime of which CONVEX THREE was but a small pattern.

(c) A drastic reduction in this load must be devised.

(d) This problem is closely connected with some of the fundamental principles of command as indicated below:

1. Delegation of tasks and missions to subordinate commanders.

2. Assumption that subordinate commanders are performing such tasks and missions without detailed message reports on routine matters concerned therewith.

3. Greater care in drafting of operation orders and in the preparing and addressing of messages in order to eliminate uncertainty and further interrogation.

3. Naval Control of Shipping Organization - As in previous exercises of this type, the NCSORG performed its duties in a highly creditable manner. The following comment is submitted:

a. Sailing Orders - A limited study of copies of sailing orders delivered during CONVEX indicates a general understanding of the requirements for organizing and sailing convoys. However, there is a lack of uniformity, and in some cases of substance, which might cause confusion among the masters of merchant ships during war. A basic guide for preparing sailing orders will be published in a forthcoming copy of CINCLANTFLT's Shipping Control Information Bulletin.

b. Operational Control - NCSO's do not exercise operational control. They act for the OCA who assumes operational control of each ship when the Master thereof is presented with his sailing orders by the NCSO.

c. Shipping Control Messages - Shipping control messages and drill messages were received from Portland, Maine, to the Canal Zone. Improvement in the drafting of these messages has been very noticeable and indicates the value of training received in previous exercises.

4. Handling Forces at Sea.

a. Convoys.

(1) A very realistic aspect of CONVEX THREE was the formation of the convoys using merchant ship procedure. Although a somewhat artificial command setup was engendered for forces at sea by requiring the OTC to be the senior officer present instead of the escort commander, it is envisioned that during wartime some Convoy Commodores will be qualified to be the OTC in lieu of the Escort Commander and will be so ordered by the sailing authority.

(2) The shipping schedule established by CINCLANTFLT was met in practically all cases and the smooth performance in providing surface and air escort has been noted with pleasure.

b. Informing Operational Commanders - In general, commanders at sea exercised initiative in breaking radio silence to inform controlling authorities of the existing situation. However, there were sufficient instances of lack of information to have caused concern in war. Specific comment follows:

(1) Several task groups were placed out of action without immediate transmittal of such a status. As a result, the Umpire Rules prohibited such transmissions for a considerable period of time.

(2) Contact reports were often not complete and many amplifying reports did not contain positions of the engaged units or the contacts.

c. Loss of Escorts - In general, the loss of escorts can be considered a result of their sonar limitations, the relatively large number and the spirited and skillful tactics of enemy submarines employed. However, in several instances, entire escort groups were placed out of action in situations where different tactics or employment of sonar would most probably have prevented their destruction.

d. Mobile H/K Groups.

(1) It now appears that carrier groups employed as H/K groups could have been more profitably employed in the general area to the southwest of Bermuda. This area, in addition to being at the extreme range of the shore-based air used during the problem, was also that used by many transitting submarines.

(2) However, these groups were used in the general vicinity of reported submarine sightings; and, whereas no confirmed sinkings were made, they performed a large share of the air cover which prevented the enemy submarines from obtaining attack positions on friendly convoys.

e. Shore-Based H/K Groups.

(1) For the first time in a CONVEX exercise, hunter-killer groups composed of shore-based air and surface escorts were used. Whereas, the surface units involved were badly battered by enemy submarines, their continued hold-down of an enemy submarine for fifty-two (52) hours is considered to be an exceptionally fine performance.

(2) The Commander in Chief considers that the use of such H/K units is of considerable value and contemplates increased emphasis on this valuable weapon in future CONVEX exercises.

5. ASW Operations. In general, the prosecution of ASW was performed in a satisfactory manner. The following observations are made:

a. The difficulty of detecting a submarine prior to penetration of the screen was again apparent.

b. Identification of contacts was a major problem.

c. Escorts used in surface attack units or other duty away from convoys or task groups and independents suffered particularly heavy losses.

d. Enemy submarines were particularly aggressive against surface escorts. Comparable losses during wartime would severely cripple our ability to protect shipping.

e. Air operations appeared to be of particular value in preventing submarines from obtaining favorable attack positions.

6. Air Defense Operations. A new threat to enemy shipping was injected into CONVEX THREE that was not employed in CONVEX TWO. This was the threat of enemy aircraft operating either as long-range reconnaissance aircraft with capability of attacking convoys, as well as tracking and reporting them, or as mine laying aircraft. The operations of enemy air served to point up effectively the requirements for air defense of shipping approaching the western coast of Europe. The Commander in Chief has reason to believe that many enemy aircraft attacks experienced during CONVEX THREE by own forces were not reported to Fleet Headquarters,

7. Raider Action. A raider threat is considered to be a very real menace to our convoys in future wartime operations in certain areas. The raider actions in the exercise again demonstrated the necessity for early detection, continuous tracking, and vigorous counter-action in order to minimize its potential destructiveness with the least disruption to scheduled shipping movements.

8. Friendly Submarine Transits. One problem that became apparent early in the exercise was that of safeguarding friendly submarine transits without imposing large submarine havens in areas of ASW activity. As far as can be determined in Fleet Headquarters, three submarines early in the problem were attacked by OWN forces while in a non-exercise status. Complete details of these incidents are not available at this time. Early in the problem the principle of escort for friendly submarine in transit through areas of possible ASW activity was adopted. The mechanics, however, for setting up friendly submarine transits appear cumbersome and apparently in need of further refinement.

D. N. SYVERSON
Flag Secretary

THE ATLANTIC COMMAND
AND UNITED STATES ATLANTIC FLEET
HEADQUARTERS OF THE COMMANDER IN CHIEF
Norfolk 11, Virginia

REFER TO
FF1-2/A4-3

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14 NOV 1951

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SECURITY INFORMATION

From: Commander in Chief U.S. Atlantic Fleet
To: Commander SECOND Fleet
Commander Destroyer Force, U.S. Atlantic Fleet
Commander Submarine Force, U.S. Atlantic Fleet

Subj: CONVEX THREE; letter directive

Encl: (1) Supplementary Instructions

1. Introduction.

a. An advanced Atlantic Fleet exercise in the control and protection of shipping, to be known as CONVEX THREE, will be conducted during the period 27 February to 19 March 1952.

b. A special phase of CONVEX THREE in submarine antisubmarine warfare will be conducted during the latter portion of CONVEX THREE, commencing on 17 March 1952, and will continue until 22 March 1952. This phase will be known as CONVEX THREE BAKER.

2. General Plan.

a. The area of operations will, in general, be bounded on the east by a line between New York and Trinidad; on the south by the northern coast of South America between Trinidad and Panama; on the west by a line running from Panama around the western tip of Cuba and thence north along the east coast of the United States to New York.

b. Convoys and independent shipping will actually be routed along the following planned convoy routes:

New York-Key West	Key West-Panama
New York-Guantanamo	Guantanamo-Panama
New York-San Juan	San Juan-Trinidad
Key West-Guantanamo	San Juan-Panama

c. Joining ships or groups of ships known as "JOINERS" will be scheduled on convoy routes, units sailing from Norfolk and Charleston.

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d. Opposed to the shipping outlined above, there will be enemy submarine forces. The number of submarines actually operating in the area will be limited to that which a potential enemy might conceivably operate in this same area as a peak effort over a reasonably short period of time. It is considered, therefore, that the control of shipping, the protection of shipping against submarines (including submarine laid mines), and the conduct of antisubmarine warfare in this area, as envisaged, is completely realistic in the light of Russian capabilities.

e. No greater threat to our own shipping may reasonably be expected in these waters during any war of the foreseeable future. However, it is desired that CONVEX THREE offer the opportunity of training in the protection of shipping against two other very pertinent threats which undoubtedly will be encountered in the eastern Atlantic - the threat of enemy air and the threat of a significant enemy mining effort by both submarines and air. Accordingly, the commander of the enemy forces in CONVEX THREE will be given air forces which may be used in accordance with the following general concept and under detailed restrictions as imposed by the OCE:

(1) the islands following the general line Key West-Guantanamo-San Juan will be considered as simulating the western coast of Europe. Enemy air forces based along this line may be used against shipping approaching it at right angles, either from the north or from the south. Regardless of the direction of approach, the simulated condition is that of shipping approaching the western coast of Europe.

(2) In general, the enemy air forces should be used for: First, reconnaissance duties in support of submarine activity; second, air attack against shipping and its escort; third, mining of our own harbors and mineable waterways.

(3) In making up detailed restrictions, the OCE should simulate the following conditions which are deemed realistic: First, the enemy has no air bases closer than 300 miles to the western coast of Europe; second, friendly fighter cover is provided within a radius of 100 miles of each important port or focal point to such a degree that enemy air activity within this radius would be prohibitive in cost save for night operations involving mining of harbors and waterways.

f. A third additional threat, that of raider action, is hardly to be expected within this area of operations nor in the western approaches to the European continent but it is to be expected along the less traveled ocean routes. Accordingly, in order to inject training in protection of shipping against this threat, the commander of enemy forces will be given a raiding capability. Realistic restrictions will be imposed.

g. Within the limits of artificialities outlined above, it is desired that CONVEX THREE be carried out, down to the smallest detail, with the greatest possible realism.

3. Purposes. The specific purposes of the planned exercise are:

a. To promote the general readiness of the Atlantic Fleet to conduct its wartime mission in the control and protection of shipping and the conduct of antisubmarine warfare, (1) within the prescribed exercise area; and, (2) in other areas in which additional enemy threats are significant.

b. To test out and promote familiarization with CINCLANTFLT Operation Order No. 3-51.

c. To provide actual operational training of elements of the Naval Control of Shipping Organization which will be called upon to carry out their precise wartime functions.

d. To promote tactical training of Atlantic Fleet forces in the handling of mercantile convoys.

e. To promote tactical training of ASW forces.

f. To promote tactical training of escort groups in the protection of shipping against air, raider and mining threats.

g. To promote tactical training of air forces in offensive action against enemy shipping.

h. To promote tactical training in offensive submarine operations.

i. To promote tactical training and development of mining efforts against enemy shipping.

j. To promote general familiarity of Atlantic Fleet forces with the specific climatic and hydrographic conditions within the area of operations.

4. Basic Command Responsibilities.

a. COMSECONDFLT will serve as the officer conducting the exercise, OCE, and as such will be:

(1) The coordinating agency for the conduct of the exercise.

(2) The Chief Umpire and Chief Observer.

(3) Deputy CINCLANTFLT in discharging those responsibilities, upon which, by reason of the exercise artificialities, CINCLANTFLT would not be in a position to take action. (This provision envisages emergency situations which might not come to the attention of CINCLANTFLT because of the particular nature of the exercise communication circuits).

b. CINCLANTFLT will serve in his planned wartime capacity as defined in CINCLANTFLT Operation Order No. 3-51. As such, he will be in overall command of OWN FORCES.

c. COMDESLANT will serve in overall command of ENEMY FORCES. He will be assigned submarine, air, mining and raider components and commanders thereof. The command facilities assigned him will be necessarily artificial in nature, but will be so arranged as to least interfere with desirable realism.

d. COMSUBLANT will serve as the officer conducting the exercise, OCE of the SSK phase, CONVEX THREE BAKER, and as such will schedule this phase. He should request from CINCLANTFLT such assistance and additional forces as required.

5. Planning Responsibilities. In accordance with the above outline of command relationship, the following planning responsibilities are to be assumed on receipt of this directive:

a. COMSECONDFLT will:

(1) Issue special and separate instructions covering exercise artificialities affecting the two forces, as necessary, to CINCLANTFLT and COMDESLANT.

(2) Issue such instructions as are necessary for the establishment and operation of Umpire and Observer organizations.

(3) Issue to both Forces such detailed rules and procedures, including Umpire Rules, as are deemed to be necessary. (Insofar as practicable, these should be submitted to CINCLANTFLT for approval prior to issuance).

b. CINCLANTFLT will plan for and issue any and all necessary instructions and orders for the actual operations of OWN FORCES in the exercise. Advance copies of such instructions will be furnished to COMSECONDFLT to assure that no basic conflict exists between CINCLANTFLT's plans and those of COMDESLANT.

c. COMDESLANT will do likewise for ENEMY FORCES in the exercise. Advance copies of such instructions will be furnished to COMSECONDFLT to assure that no basic conflict develops between CINCLANTFLT's plans and those of COMDESLANT.

d. COMSUBLANT will plan for and issue any and all necessary instructions and orders for CONVEX THREE BAKER. The concept of antisubmarine operations shall be reviewed and approved by CINCLANTFLT.

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6. Forces Assigned. Those forces which are scheduled to participate in CONVEX THREE (see enclosure (1)) shall be considered to have reported for planning purposes. All forces assigned will report to operational commanders for OPCON on 25 February.

7. Reports. Reports on all phases of the exercise will be submitted in accordance with directives of COMSECONDFLT, and/or commanders of the two opposing forces. COMSECONDFLT should submit a brief report of the exercise to CINCLANTFLT.

L.D. McCORMICK

Copy to:(complete)
CNO (10)
CINCPACFLT (5)
CINCNELM (5)
COMEASTSEAFRON (10)
COMSECONDFLT (10)
CGFMFLANT (2)
COMAIRLANT (10)
COMPHIBLANT (5)
COMDESLANT (10)
COMCARIBSEAFRON (10)
COMCRULANT (5)
COMSUBLANT (10)
COMFAIRWINGSLANT (5)
COMTRACOMDLANT (5)
COMOPDEVFOR (2)
COMSERVLANT (5)
COMPHIBTRALANT (2)
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COMCARDIV 14 (2)
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COMDESFLOT 2 (2)
COMDESFLOT 4 (2)
COMDESFLOT 6 (2)
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COMTHREE (2)
COMFIVE (2)
COMSIX (2)
COMEIGHT (2)
COMFIFTEEN (2)
CO NAVSTA BERMUDA (2)

D. N. SYVERSON
Flag Secretary

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CONVEX THREE - SUPPLEMENTARY INSTRUCTIONS

1. Participating Forces. Participating forces will be as indicated in the Quarterly Employment Schedule for the U.S. Atlantic Fleet for the Third Quarter 1952, and as may be further modified. Tentatively, it is anticipated that the following general assignments will be made:

a. OWN FORCES

Eastern and Caribbean Sea Frontiers and appropriate Shipping Control Offices therein.

5 - 6 groups (30 - 34 ships) of amphibious and service types simulating mercantile convoys.

Shore-based A/S aircraft (3 to 5 VPRONS, 4 ZPRONS, available VSRONS, and 1 AVP).

54 - Escort types.

Carrier-based air - 1 CVL (VSRON embarked)
1 CVL (VFRON embarked)
2 CVE (VSRONS embarked with fighter detachments).

1 - Cruiser (simulated "Monster").

Minesweeping Forces.

Salvage Forces.

Appropriate Naval District and available Naval Reserve Craft.

b. ENEMY FORCES

1 - Fleet Air Wing Commander
1 or 2 VPRONS (mining and attacks on shipping).
1 VCRON.

1 - SUBRON Commander
8 - 10 Submarines (mining and offensive attacks on shipping).

1 - Cruiser (simulated raider).

2. Special Area Delineation.

a. Operations in connection with CONVEX THREE will be conducted in the area bounded by the following rhumb lines and shore lines:

(1) From Montauk Pt., L.I., New York to eastern tip Bermuda, BWI.

(2) Thence to eastern tip Trinidad, BWI.

(3) Thence along the coasts of South America and Central America to Cape Catoche, Yucatan Peninsula.

(4) Thence to Tampa, Florida.

(5) Thence along the coast of the United States to Montauk Pt., L.I., N.Y.

b. Operations will not be conducted within the territorial waters of any foreign nation except as may be required: (1) by ingress and egress to scheduled ports; and, (2) in emergency.

3. Exercise Conditions. CONVEX THREE has been designed to simulate those conditions to be expected in the early months of any future war by our forces when operating along the western coast of Europe. To further this concept, the following exercise conditions will be in effect:

a. OWN AIR

(1) Small carriers will be available for protection of important convoys and mobile H/K operations. In view of the probability of enemy air attack, all carrier groups will have some fighter protection.

(2) Shore-based air will be available in limited amounts for coverage of major convoy assembly ports and protection of convoys at sea. It is considered that not more than one plane should be available for coverage of any convoy save at focal points of shipping. The enemy can realistically expect VP and ZP aircraft from bases at any or all of the following locations:

(a) Lakehurst

(b) Norfolk

(c) Weeksville

(d) Glynco

(e) Bermuda

(f) Guantanamo

(g) Trinidad

(h) Panama

b. ENEMY AIR

General instructions regarding operations of enemy air forces are contained in the basic letter, (para. 2.e.(3)).and will be amplified by the OCE. Such air forces may be based, at the discretion of the Commander Enemy Forces, at any point along the line Key West-Guantanamo-San Juan. Inasmuch as both Own and Enemy air forces may be based at the same locations, special instructions as to non-interference of operations should be promulgated.

c. Due to Own and Enemy mine fields and for the additional purpose of minimizing the time devoted to the attacking of non-exercise forces, the following conditions will be maintained:

(1) Enemy submarines will not operate in water of less than 25 fathoms depth save for the purpose of laying mine fields.

(2) Own Forces will not proceed in waters of less than 25 fathoms save for ingress and egress to port.

4. Basic Policies for the Conduct of the Exercise.

a. For the conduct of the exercise, the orders and instructions issued at all echelons of command, and the actual operation of forces during the exercise, should reflect the purpose outlined in paragraph 3 of the basic letter to the maximum degree practicable.

b. As the assumed period of time in which the envisioned operation takes place is during the first few months of general hostilities, inevitable shortages in certain categories of forces may therefore be looked upon as realistically imposed conditions.

c. In the conduct of the exercise every effort should be made to develop: (1) a realistic attitude toward command functions and procedures; and, (2) a wartime attitude toward the hazards and penalties of damage.

d. Every effort should be made to provide realism in the case of those ships declared "out of action." In general, such ships should be kept out of action for a reasonably long period of time and should be permitted to return to action only at a point well removed from that at which they were declared "out of action."

e. In time of war a submarine shore command will not normally be aware of the loss of one of its units except by its failure to communicate or failure to return on time from patrol. Such conditions shall be dup-

licated in CONVEX THREE. When submarines return to an "in action" status they should be a considerable distance from the area in which they are placed out of action, and shall not regain nor reveal their former identity. The Chief Umpire is authorized to furnish sealed instructions to be opened by each participating submarine upon assuming an "out of action" status containing a new identity and radio call sign. The shore submarine operating commander shall assume such submarine upon reporting itself "in action" to be a new submarine having completed its transit to the patrol zone and requiring specific patrol instructions. The submarine shall not indicate in the text of any message facts from which a conclusion may be drawn as to its former identity or patrol station. Neutral communication circuits should be provided COMSUBLANT, as appropriate for safety considerations.

f. Surface ships, other than those of the convoy, will be permitted normal communications for 5 minutes subsequent to their being declared "out of action." This is to simulate the period between attack and sinking.

g. All exercise communications to and from "out of action" ships will be transmitted via COMSECONDFLT who shall determine whether or not such messages are in the spirit of the exercise and, if not, will so inform the originator without passing along the message.

h. Units will report for OPCON to their respective Operational Commanders on 25 February 1952. The period 25-26 February is available for initial deployment of units and for constructive mining by submarines. Deployment prior to 25 February is not desired. Subsequent to submarine minelaying 25-26 February, if any, normal war loading may be assumed for submarines so engaged.

5. Communications.

a. Separate and distinct communication systems, including radio and cryptographic facilities, will be made available by separate correspondence to CINCLANTFLT and COMDESLANT.

b. COMSECONDFLT should arrange with CINCLANTFLT for necessary Umpire and Observer communication facilities.

c. Basic Op-Orders issued by Own and Enemy Force Commanders should prescribe specific times and dates that task organizations and communication calls generated therefrom are effective.

6. Intelligence Available to OWN FORCES.

a. The enemy is assumed to have a capability of operating 8 to 10 submarines in the Exercise Area simultaneously.

b. There is no indication that the enemy is capable of using "wolf pack" tactics.

c. In order to communicate with his bases (assumed to be in Eastern Europe), the enemy will require full-power radio transmissions.

d. There are indications that enemy submarines have conducted mine-laying operations off the U.S. East Coast. Enemy capabilities include mining by ground mines out to 25 fathoms, and by moored mines out to 100 fathoms.

e. The enemy will provide air opposition (including simulated mining) from shore bases.

f. The enemy will operate a raider against convoys.

7. Intelligence Available to ENEMY FORCES. The following information is assumed to be in possession of Enemy Forces and accordingly should be taken into account in planning of operations.

a. The following convoy and independent shipping routes are expected to be employed:

(1) From East Coast ports of New York, Norfolk, Charleston and Key West; to Guantanamo, Panama, Trinidad and San Juan; including return routes.

(2) Between the East Coast ports of New York, Norfolk, Charleston and Key West.

(3) Between the Caribbean ports of Trinidad, San Juan, Panama and Guantanamo.

b. Mine operations between Long Island and Key West will prohibit submarine operations inside 25 fathoms.

c. It is known that "Own Forces" intend to route independent shipping. However, it is definitely known that they will supply at least one escort for each ship sailed independently within the exercise area. (This is an artificiality which will be carried out in order that submarines may readily identify exercise shipping.) Legitimate mercantile targets for submarines will therefore be included in groups of two or more ships. This does not preclude combatant ships proceeding singly.

d. "Own Forces" will have shore-based and carrier-based air support for convoys and will operate mobile hunter-killer groups.

D.N. SYVERSON
Flag Secretary